MANPOWER REQUIREMENTS

Economic Planning Branch
Policy Planning Division
Department of Treasury and Economics

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Hon. W. Darcy McKeough
Treasurer of Ontario
and Minister of Economics

H. Ian Macdonald
Deputy Minister

September, 1971

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MANPOWER REQUIREMENTS

The shifting structure of our economy over the past century has been possible with relatively little emphasis on planning of manpower requirements. We have been able to accomplish this through the device of filling the inadequacies in our own educational and training system through immigration. The Province is reaching a stage of maturity when we should be able to train most of our own work force. The shifts in industrial patterns have been quite marked (Table p. 2), and if we are to have continued economic growth, we have to provide the kinds of workers needed by the growth industries. The emphasis in training is influenced by the kind of industry which we expect to have.

Employment by Industry

The 19th century was highlighted by a breakthrough in the development of trade and manufacturing and the 20th century is witnessing a service revolution. In 1991, only three out of every 10 workers in Canada were employed in the service sector; 50 years later, more than half were in services. In recent years, this shift from manufacturing to services has accelerated as growth in manufacturing employment between 1961 and 1970 increased by only 32 per cent, whereas service employment increased by 55 per cent. New technical developments and the resultant productivity improvements in the goods producing sector presages a continuation of these trends. Our projections indicate that by 1991 seven out of

Percentage Distribution of Ontario Labour Force
by Major Industry Groups, 1931-1991

Industry	Historical (per cent)				Projected (per cent)	
	1931	1941	1951	1961(1)	1971	1991
Agriculture	22.5	18.6	10.7	7.2	4.4	1.4
Forestry, Fishing & Trapping	1.1	1.5	1.3	0.9	0.5	0.3
Mines, Quarries & Oil Wells	1.4	2.2	1.6	1.8	0.9	0.4
Manufacturing	24.4	30.6	32.8	27.3	28.5	24.3
Construction	6.8	5.4	6.7	6.5	6.3	4.8
Transportation, Communication and Other Utilities(2)	7.1	5.8	6.7	8.3	6.9	4.4
Trade	11.1	12.2	14.2	15.8	16.1	15.3
Finance, Insurance & Real Estate	2.8	2.7	3.3	4.2	4.3	4.9
Electricity, Gas & Water	1.0	0.8	1.6	-	-	-
Community, Business & Personal Service Industries	18.3	19.3	20.1	19.8	23.8	34.2
Public Administration and Defence(3)	-	-	-	6.0	6.1	7.5
Not stated	3.5	0.9	1.0	2.2	2.2	2.5
Total Labour Force	100.0	100.0	100.0	100.0	100.0	100.0

(1) 1961 data has not been adjusted to conform with previous census definitions.
(2) Before 1961 public utilities are not included in this group.
(3) 1931 to 1951 Public Administration is included in Community, Business and Personal Services.

Source: 1931 to 1951, Occupation & Industry Trends in Canada. DBS, Ottawa 1954
1961, Census of Canada 1961, Series 3.2-8.
Projections prepared in the Economic Planning Branch.

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every 10 workers will be in the service sector.

By 1991 the service sector of the economy will require over 3.3 million workers, that is, 2.67 times as many as in 1961. On the other hand, employment in the manufacturing sector is expected to increase by only 83 per cent. In short, service jobs will account for the overwhelming bulk of the increase in the total employment. By 1991 service jobs can easily constitute about two-thirds of all jobs in our economy.

We anticipate an increase in manufacturing jobs of about 355,000 between 1971 and 1991 as compared with almost a million increase in community, business, and personal services industries. Trade is expected to employ an additional 277,000 and the finance, insurance, and real estate industry, an additional 113,000 people. Employment in public administration and defence will about double in the 20 year period, increasing from 185,000 to 373,000 between 1971 and 1991.

A detailed breakdown of the anticipated changes in employment by industry group is shown in Table A-1. A further examination of the expected employment trends on an occupational job family basis, provides additional insights into the shifting structure of our labour market.

Trends in Job Families

The clerical job family will employ the largest proportion of the labour force in 1991. In fact, one of every six jobs will be in this area, about 80 per cent of them in the service industry, (Table p. 5). A continued high rate of economic growth will require a substantial increase in the technician, skilled worker and tradesmen groups, particularly in manufacturing. It should be noted, however, that while the tools - non-specialized job family is expected to remain second in importance, it will continue to decline as a proportion of the total labour force. The personal service job family is expected to increase significantly from 8.7 per cent of the total labour force in 1971 to 11.9 per cent in 1991 and will be the third largest group. It is followed closely by administration and organization, largely confined to the service industry and likely to account for one of every 10 jobs at the end of the projected period. Other occupational groups which are expected to show relatively large increases in demand are health, education, machines - non-specialized and sales.

Educational Requirements

A review of the educational achievement of the 25-34 age group in each job family by industry, in the 1961 census, together with the more recent trends in educational standards and hiring practices gives a broad indication of the educational inputs required to satisfy the demands of our growing industries.

Employment Requirements in Ontario, by Job Family
for 1971 and 1991

Job Family	Total Employment 1971 No.	%	Total Employment 1991 No.	%	Absolute Change 1971-91	Percentage Change 1971-91
Labour Force	3,017,940	100	4,977,750	100	+1,959,810	+64.9
Tools - Specialized	123,735	4.1	179,199	3.6	+55,464	+44.8
Tools - Non-specialized	507,014	16.8	771,551	15.5	+264,537	+52.2
Machines - Specialized	54,323	1.8	64,711	1.3	+10,388	+19.1
Machines - Non-specialized	274,632	9.1	408,176	8.2	+133,544	+48.6
Inspection	105,628	3.5	154,310	3.1	+48,682	+46.1
Vehicle Operation	144,861	4.8	199,110	4.0	+54,249	+37.4
Farm	123,736	4.1	69,689	1.4	-54,047	-43.7
Sales - Knowledge req'd	78,466	2.6	119,466	2.4	+41,000	+52.3
Sales - Knowledge not req'd	165,987	5.5	238,932	4.8	+72,945	+43.9
Clerical	497,960	16.5	851,195	17.1	+353,235	+70.9
Personal Service	262,561	8.7	592,352	11.9	+329,791	+125.6
Entertainment	18,108	.6	39,822	.8	+21,714	+119.9
Protection	39,233	1.3	74,666	1.5	+35,433	+90.3
Education and Training	102,610	3.4	238,932	4.8	+136,322	+132.9
Health	141,843	4.7	308,621	6.2	+166,778	+117.6
Welfare	21,126	.7	49,777	1.0	+28,651	+135.6
Administration and organization	298,776	9.9	512,708	10.3	+213,932	+71.6
Research and Design	57,341	1.9	104,533	2.1	+47,192	+82.3

Source: Estimated by Department of Treasury and Economics.

- Most of the 353,000 new clerical jobs in the next twenty years will require graduation from a secondary school commercial course.

- The 464,000 anticipated new mechanical, machine-oriented and tradesmen's jobs will be filled from on the job training, secondary school and community college graduates. There were an estimated 11,700 full-time, post-secondary students enrolled in technical or technological courses at the colleges in 1970-71, compared with 9,460 in 1969-70.

- Much of the increase in the personal service industries is in such areas as restaurants, hotels, recreational facilities, barber shops and hairdressing salons. People in these occupations are being trained in the Community Colleges and in some of the manpower, private trade schools and adult retraining courses.

- With respect to the managerial, administration and organization occupation family, some of the demand is for university graduates, but there is also a large requirement for people with some basic business education, along with some practical orientation. This area could draw a major part of its labour supply from the Community Colleges - where full-time, post-secondary enrolment in business courses totalled almost 10,000 in 1970-71. In the sectors where knowledge of the operation is important and where the manager is the main worker, other post-secondary institutions will provide some of the managerial personnel.

Employment in welfare is rising more rapidly than most other industries but since the base employment is relatively low, the increase in actual numbers is not expected to be significant. In terms of educational requirements, a large proportion of the labour force in this job family requires training at the university level. The development of specialized courses in the social welfare field at the Community College level will relieve the demand for university graduates in this area and will restrain the need for university trained personnel.

Most job opportunities in the area of research and design also require a university education. It should be noted once again, however, that this occupational group accounts for only a small proportion of the entire labour force. With respect to employment conditions in the field of research and design, there exists a large surplus of graduates in chemistry, chemical engineering and biochemistry, particularly at the Ph.D. level. In fact, the majority of students placed for the 1971-72 season are engaged in further study at all graduate levels, including post-doctoral studies. New employment opportunities have not been increasing at nearly the rate of university expansion. This lack of flexibility on the part of educational institutions can be found in other occupational groups as well. For example, in the education and training job family, there exists an oversupply of teachers at the elementary level.

Institutional Requirements

More stringent control over the numbers entering certain university courses is necessary. The first step in influencing enrolment in university programs is to restrict aid to graduates and post-graduates in some of these areas where Canadian demand is never likely to be very large. Moreover, the present practice of holding people in their studies, to try to absorb a labour market surplus, is in the long run an unkindness as it will make the graduates less flexible. They will find it more difficult to accept anything but high level research jobs.

The Community Colleges, which have been moving into operation very rapidly, should be preparing the more job-oriented students for employment in business and industry. To help meet future training and educational needs, the kinds and number of Community College courses need to be increased, particularly those courses geared to occupations in the personal service industries. By shifting a larger part of the undergraduate flood to the new colleges of applied arts and technology, we would ease the anticipated shortage of undergraduate places at the university level.

As indicated in the foregoing discussion regarding the educational requirements of job families, much of the labour force expansion expected over the next 20 years will be filled from secondary school - about 50 per cent - with Community

Educational Requirements of Ontario Labour Force Increase 1971-1991

	Elementary	Secondary	Community College and Other Post-Secondary	University	Totals
Arts	124,000	338,300	105,300	190,500	758,100
Commerce	17,600	475,600	95,900	76,900	666,000
Health	5,100	0	112,300	56,200	173,600
Science, Mechanical and Trade Training	75,200	204,100	39,200	43,600	362,100
Totals	221,900 (11%)	1,018,000 (52%)	352,700 (18%)	367,200 (19%)	1,959,800 (100%)

Note: For detailed breakdown, see Table A-2.

Source: Department of Treasury and Economics.

College graduates accounting for an additional 18 per cent. Notwithstanding the fact that some of the growth in demand will be for university graduates, training at this level will not constitute more than 20 per cent of overall educational requirements. In short, about 40 per cent of the increase in the Ontario labour force between 1971 and 1991 will require a post-secondary education. By comparison, in 1961 only 10 per cent of the Ontario labour force had achieved a post-secondary (university) education.

While over one-half of the jobs requiring a university education in 1991 will be in the area of arts, only about one-tenth will be in science, (Table p. 9). With respect to the educational requirements at the Community College level, about one-third will be in each of arts and health. While commerce and science together should account for the remaining number, science alone will constitute only about 10 per cent of the Community College total.

TABLE A-1

Projections of Employment in Ontario, by Industry and Sector
for 1971 and 1991
(most probable)

Industry	1971	1991	Absolute Change	% Change
Agriculture	132,190	72,250	-59,940	-45.3
Forestry, Fishing & Trapping	14,330	13,210	-1,120	-7.8
Mines, Quarries & Oil Wells	28,090	22,070	-6,020	-21.4
Manufacturing Industries	860,500	1,215,170	+354,670	+41.2
Food & beverage industries	108,660	152,240	+43,580	+40.1
Meat Products	12,660	17,010	+4,350	+34.4
Dairy Products	6,440	4,630	-1,810	-28.1
Fruit & Vegetable Canners & Preservers	15,260	23,890	+8,630	+56.6
Grain Mills	7,910	16,270	+8,360	+105.7
Bakery Products	17,360	19,050	+1,690	+9.7
Soft Drink Manufacturers	7,750	15,410	+7,660	+98.8
Distilleries	3,460	2,910	-550	-15.9
Breweries	3,510	2,650	-860	-24.5
Other Food & Beverage Industries	34,310	50,420	+16,110	+47.0

Industry	1971	1991	Absolute Change	% Change
Tobacco Products Industries	4,370	5,050	+680	+15.6
Rubber Industries	18,370	35,590	+17,220	+93.7
Leather Industries	16,420	21,640	+5,220	+31.8
Shoe Factories	10,020	12,560	+2,540	+25.3
Other Leather Products	6,400	9,080	+2,680	+41.9
Textile Industries	29,690	25,530	-4,160	-14.0
Cotton Yarn & Cloth Mills	4,070	6,540	+2,470	+60.7
Woollen Mills	6,060	3,880	-2,180	-36.0
Synthetic Textile Mills	7,150	5,110	-2,040	-28.5
Other Textile Industries	12,410	10,000	-2,410	-19.4
Clothing & Knitting	34,210	57,000	+22,790	+66.6
Wood Industries	18,350	29,600	+11,250	+61.3
Saw & Planing Mills	11,600	12,840	+1,240	+10.7
Veneer & Plywood	2,870	4,720	+1,850	+64.5
Other Wood Industries	3,880	12,040	+8,160	+210.3
Furniture & Fixture Industries	19,390	32,860	+13,470	+70.2
Paper & Allied Industries	45,530	71,880	+26,350	+57.9
Pulp & Paper Mills	20,350	15,890	-4,460	-21.9
Other Paper Products	23,180	55,990	+32,180	+138.8

Industry	1971	1991	Absolute Change	% Change
Printing, Publishing & Allied Industries	49,630	69,350	+19,720	+39.7
Primary Metal Industries	69,410	74,690	+5,280	+7.6
Metal Fabricating Ind. (except machinery & transportation equipment industries)	77,580	91,230	+13,650	+17.6
Machinery Industries (except electrical machinery)	53,800	47,240	-6,560	-12.2
Transportation Equipment Industries	104,520	141,180	+36,660	+35.1
Aircraft & Parts	14,260	13,020	-1,240	-8.7
Motor Vehicles Manufacturers	39,250	44,800	+5,550	+14.1
Motor Vehicle Parts & Access. Mfrs.	39,340	68,500	+29,160	+74.1
Railroad Rolling Stock	3,900	6,440	+2,540	+65.1
Shipbuilding & Repair	2,050	960	-1,090	-53.2
Other Transportation Equipment Industries	5,520	7,460	+1,940	+35.1
Electric Products Industries	83,350	191,360	+108,010	+129.6
Manufacture of Major Appliances	13,000	27,090	+14,090	+108.4
Communication Equipment Appliances	24,650	34,680	+10,030	+40.7
Manufacturers of Electrical Industrial Equipment	17,980	28,720	+10,740	+59.7

Industry	1971	1991	Absolute Change	% Change
Other Electrical Equipment Manufacturers	27,720	100,870	+73,150	+262.9
Non-Metallic Mineral Products Industries	27,240	47,860	+20,620	+75.7
Cement Manufacturers	1,610	1,970	+360	+22.4
Concrete Product Manufacturers	5,920	10,740	+4,820	+81.4
Clay Products Manufacturers	3,330	2,990	-340	-10.2
Other Non-Metallic Mineral Products	16,380	32,160	+15,780	+96.3
Petroleum & Coal Products Industries	7,030	4,500	-2,530	-36.0
Chemical & Chemical Products "	42,880	47,460	+4,580	+10.7
Miscellaneous Manufacturing "	52,070	74,910	+22,840	+43.9
Construction Industry	189,140	238,240	+49,100	+26.0
Transportation, Communication and other Utilities	208,620	220,540	+11,920	+5.7
Transportation	120,200	132,650	+12,450	+10.4
Air Transportation & Services Incidental to Air Transport	6,310	6,370	+60	+1.0
Water Transport & Services Incidental to Water Transport	6,580	5,870	-710	-10.8
Railway Transport	35,960	24,220	-11,740	-32.6
Truck Transport	34,320	54,000	+19,680	+57.3
Bus Transport, Interurban and Rural	2,010	3,380	+1,370	+68.2

Industry	1971	1991	Absolute Change	% Change
Urban Transit System	8,580	9,630	+1,050	+12.2
Other Transportation				
Storage	3,220	2,330	-890	-27.6
Communication	48,980	38,040	-10,940	-22.3
Electric Power, Gas & Water Utilities	36,220	47,520	+11,300	+31.2
Total Trade	487,510	764,240	+276,730	+56.8
Wholesale Trade	131,170	230,730	+99,560	+75.9
Retail Trade	356,340	533,510	+177,170	+49.7
Finance, Insurance & Real Estate	130,610	243,900	+113,290	+86.7
Community, Business & Personal Service Industries	716,870	1,707,830	+990,960	+138.2
Public Administration and Defence	185,080	372,670	+187,590	+101.4
Total Service Sector	1,728,690	3,309,180	+1,580,490	+94.3
Total Non-Manufacturing Industries	2,092,440	3,654,950	+1,562,510	+74.7
Industry, Unspecified & Undefined	65,000	107,630	+42,360	+65.2
Grand Total	3,017,940	4,977,750	+1,959,810	+64.9

TABLE A-2

Type of Education Required for Additional Jobs 1971-1991

Ontario

Agriculture -60,000

Job Family	Science				Arts				Commerce			
	E	S	CC	U	E	S	CC	U	E	S	CC	U
1. Tools-Spec.												
2. Tools-Non-Spec.												
3. Machines Spec.												
4. Mach.-Non-Spec.												
5. Inspection												
6. Vehicle Operat.												
7. Farm	22,700	32,800		1,100								
8. Sales Know.Req.												
9. Sales Know. Not.												
10. Clerical										200		100
11. Personal Service	300	450		100	300	450						
12. Entertainment												
13. Protection												
14. Educat. & Train.												
15. Health												
16. Welfare												
17. Admin. & Organ.		100	100	100								
18. Research & Des.												
Total	23,000	33,350	100	1,300	300	450	0	0	0	200	0	100

Figures do not add to totals because some categories were too small to include.

Type of Education Required for Additional Jobs 1971-1991

Forestry, Fishing & Trapping -1100

Ontario

Job Family	Science				Arts				Commerce			
	E	S	CC	U	E	S	CC	U	E	S	CC	U
1. Tools-Spec.	200	300										
2. Tools-Non-Spec.												
3. Machines Spec.												
4. Mach.-Non-Spec.												
5. Inspection												
6. Vehicle Operat.												
7. Farm												
8. Sales Know.Req.												
9. Sales Know. Not.												
10. Clerical												
11. Personal Service												
12. Entertainment												
13. Protection												
14. Educat. & Train.												
15. Health												
16. Welfare												
17. Admin. & Organ.									100			
18. Research & Des.												
Total	200	300	0	0	0	0	0	0	100	0	0	

Figures do not add to totals because some categories were too small to include.

Type of Education Required for Additional Jobs 1971-1991

Mines -6,000

Ontario

Job Family	Science				Arts				Commerce			
	E	S	CC	U	E	S	CC	U	E	S	CC	U
1. Tools-Spec.												
2. Tools-Non-Spec.	300	600	100									
3. Machines Spec.	1,200	1,500	200	200								
4. Mach.-Non-Spec.	100	200										
5. Inspection	100	300										
6. Vehicle Operat.	200	100										
7. Farm												
8. Sales Know.Req.												
9. Sales Know. Not.												
10. Clerical												
11. Personal Service												
12. Entertainment												
13. Protection												
14. Educat. & Train.												
15. Health												
16. Welfare												
17. Admin. & Organ.			100	100								
18. Research & Des.				200								
Total	1,900	2,700	400	500	0	0	0	0	0	0	0	0

Figures do not add to totals because some categories were too small to include.

Type of Education Required for Additional Jobs 1971-1991

Food & Beverage +43,600

Ontario

Job Family	Science				Arts				Commerce			
	E	S	CC	U	E	S	CC	U	E	S	CC	U
1. Tools-Spec.												
2. Tools-Non-Spec.	2,600	3,400	600									
3. Machines Spec.	1,000	1,200	200									
4. Mach.-Non-Spec.	4,300	5,400	1,100									
5. Inspection	300	1,500	400	200								
6. Vehicle Operat.	2,700	3,500	700									
7. Farm												
8. Sales Know.Req.												
9. Sales Know. Not.		900	200	200					200	900	100	
10. Clerical										3,300	1,100	
11. Personal Service												
12. Entertainment												
13. Protection												
14. Educat. & Train.												
15. Health												
16. Welfare												
17. Admin. & Organ.		1,100	300	400		1,000	200	400				
18. Research & Des.			100	200				100				
Total	10,900	17,000	3,600	1,000	0	1,000	200	500	200	4,200	1,200	0

Figures do not add to totals because some categories were too small to include.

Tobacco Products +700

Type of Education Required for Additional Jobs 1971-1991
Ontario

Job Family	Science				Arts				Commerce			
	E	S	CC	U	E	S	CC	U	E	S	CC	U
1. Tools-Spec.										100		
2. Tools-Non-Spec.												
3. Machines Spec.												
4. Mach.-Non-Spec.	100	300										
5. Inspection												
6. Vehicle Operat.												
7. Farm												
8. Sales Know.Req.												
9. Sales Know. Not.												
10. Clerical												
11. Personal Service												
12. Entertainment												
13. Protection												
14. Educat. & Train.												
15. Health												
16. Welfare												
17. Admin. & Organ.												
18. Research & Des.												
Total	100	300	0	0	0	0	0	0	0	100	0	0

Figures do not add to totals because some categories were too small to include.

Rubber +17,200

Type of Education Required for Additional Jobs 1971-1991

Ontario

Job Family	Science				Arts				Commerce			
	E	S	CC	U	E	S	CC	U	E	S	CC	U
1. Tools-Spec.										400		
2. Tools-Non-Spec.	800	1,700										
3. Machines Spec.												
4. Mach.-Non-Spec.	2,000	5,700		100								
5. Inspection		900	200	100								
6. Vehicle Operat.												
7. Farm												
8. Sales Know.Req.												
9. Sales Know. Not.										2,200	100	300
10. Clerical												
11. Personal Service												
12. Entertainment												
13. Protection												
14. Educat. & Train.												
15. Health												
16. Welfare												
17. Admin. & Organ.		200	100	200						200		100
18. Research & Des.			100	300								
Total	2,800	8,500	400	700	0	0	0	0	0	2,800	100	400

Figures do not add to totals because some categories were too small to include.

Leather +5,200

Type of Education Required for Additional Jobs 1971-1991
Ontario

Job Family	Science				Arts				Commerce			
	E	S	CC	U	E	S	CC	U	E	S	CC	U
1. Tools-Spec.												
2. Tools-Non-Spec.	200	300										
3. Machines Spec.												
4. Mach.-Non-Spec.	1,300	2,000	100									
5. Inspection												
6. Vehicle Operat.												
7. Farm												
8. Sales Know.Req.												
9. Sales Know. Not.												
10. Clerical												
11. Personal Service												
12. Entertainment												
13. Protection												
14. Educat. & Train.												
15. Health												
16. Welfare												
17. Admin. & Organ.												
18. Research & Des.											100	100
Total	1,500	2,300	100	0	0	0	0	0	0		100	100

Figures do not add to totals because some categories were too small to include.

Textiles -4,200

Type of Education Required for Additional Jobs 1971-1991

Ontario

Job Family	Science				Arts				Commerce			
	E	S	CC	U	E	S	CC	U	E	S	CC	U
1. Tools-Spec.	100	200										
2. Tools-Non-Spec.					400	200						
3. Machines Spec.	200	200	100									
4. Mach.-Non-Spec.	300	400	50		300	400	50					
5. Inspection		200		100								
6. Vehicle Operat.												
7. Farm												
8. Sales Know.Req.												
9. Sales Know. Not.												
10. Clerical									300		100	
11. Personal Service												
12. Entertainment												
13. Protection												
14. Educat. & Train.												
15. Health												
16. Welfare												
17. Admin. & Organ.					100	100						
18. Research & Des.				100								
Total	600	1,000	150	200	700	700	150	0	0	300	0	100

Figures do not add to totals because some categories were too small to include.

Clothing & Knitting +22,800

Type of Education Required for Additional Jobs 1971-1991

Ontario

Job Family	Science				Arts				Commerce			
	E	S	CC	U	E	S	CC	U	E	S	CC	U
1. Tools-Spec.					2,300	1,000	100					
2. Tools-Non-Spec.					600	500						
3. Machines Spec.												
4. Mach.-Non-Spec.					8,000	5,000						
5. Inspection					200	500						
6. Vehicle Operat.												
7. Farm												
8. Sales Know.Req.										600	100	
9. Sales Know. Not.									200	1,500	100	
10. Clerical												
11. Personal Service												
12. Entertainment												
13. Protection												
14. Educat. & Train.												
15. Health												
16. Welfare												
17. Admin. & Organ.										900	200	300
18. Research & Des.												
Total	0	0	0	0	11,100	7,000	100	0	200	3,000	400	300

Figures do not add to totals because some categories were too small to include.

Wood +11,300

Type of Education Required for Additional Jobs 1971-1991
Ontario

Job Family	Science				Arts				Commerce			
	E	S	CC	U	E	S	CC	U	E	S	CC	U
1. Tools-Spec.					700	600						
2. Tools-Non-Spec.					1,900	1,900						
3. Machines Spec.												
4. Mach.-Non-Spec.					1,100	1,100						
5. Inspection	100	500	100									
6. Vehicle Operat.					400	400						
7. Farm												
8. Sales Know.Req.												
9. Sales Know. Not.												
10. Clerical						600	100					
11. Personal Service												
12. Entertainment												
13. Protection												
14. Educat. & Train.												
15. Health												
16. Welfare												
17. Admin. & Organ.		300	100	100								
18. Research & Des.										300		100
Total	100	800	200	100	4,100	4,600	100	0	0	300	0	100

Figures do not add to totals because some categories were too small to include.

Furniture +13,500

Type of Education Required for Additional Jobs 1971-1991

Ontario

Job Family	Science				Arts				Commerce			
	E	S	CC	U	E	S	CC	U	E	S	CC	U
1. Tools-Spec.												
2. Tools-Non-Spec.	2,600	2,700	200									
3. Machines Spec.												
4. Mach.-Non-Spec.	1,600	1,700	200									
5. Inspection	100	400	100									
6. Vehicle Operat.												
7. Farm												
8. Sales Know.Req.												
9. Sales Know. Not.												
10. Clerical									900	100	100	
11. Personal Service												
12. Entertainment												
13. Protection												
14. Educat. & Train.												
15. Health												
16. Welfare												
17. Admin. & Organ.									300		100	
18. Research & Des.			100				400	100	200			
Total	4,300	4,800	600	0	0	400	100	200	0 1,200	100	200	

Figures do not add to totals because some categories were too small to include.

Type of Education Required for Additional Jobs 1971-1991

Paper & Allied +26,400

Ontario

Job Family	Science				Arts				Commerce			
	E	S	CC	U	E	S	CC	U	E	S	CC	U
1. Tools-Spec.	600	700										
2. Tools-Non-Spec.	2,700	3,500	700	300								
3. Machines Spec.												
4. Mach.-Non-Spec.	2,900	4,600	800	400								
5. Inspection	100	1,200	200	200								
6. Vehicle Operat.												
7. Farm												
8. Sales Know.Req.												
9. Sales Know. Not.												
10. Clerical									2,300	200	300	
11. Personal Service												
12. Entertainment												
13. Protection												
14. Educat. & Train.												
15. Health												
16. Welfare												
17. Admin. & Organ.	400		100						400	100	200	
18. Research & Des.		100	400					100				
Total	6,300	10,400	1,800	1,400	0	0	0	100	0	2,700	300	500

Figures do not add to totals because some categories were too small to include.

Type of Education Required for Additional Jobs 1971-1991

Printing, Publishing & Allied +19,700 — Ontario

Job Family	Science				Arts				Commerce			
	E	S	CC	U	E	S	CC	U	E	S	CC	U
1. Tools-Spec.						2,000	1,000	1,100				
2. Tools-Non-Spec.	100	900										
3. Machines Spec.	200	1,400	100	100								
4. Mach.-Non-Spec.	100	800										
5. Inspection						200		100				
6. Vehicle Operat.												
7. Farm												
8. Sales Know.Req.												
9. Sales Know. Not.						600	600	600				
10. Clerical					500	3,500	100					
11. Personal Service												
12. Entertainment												
13. Protection												
14. Educat. & Train.												
15. Health												
16. Welfare												
17. Admin. & Organ.						1,000		900		500	300	
18. Research & Des.												
Total	400	3,100	100	100	500	7,300	1,700	2,700	0	500	300	0

Figures do not add to totals because some categories were too small to include.

Type of Education Required for Additional Jobs 1971-1991

Primary Metals +5,300

Ontario

Job Family	Science				Arts				Commerce			
	E	S	CC	U	E	S	CC	U	E	S	CC	U
1. Tools-Spec.												
2. Tools-Non-Spec.	800	1,100										
3. Machines Spec.												
4. Mach.-Non-Spec.	600	900										
5. Inspection		400	100									
6. Vehicle Operat.												
7. Farm												
8. Sales Know.Req.												
9. Sales Know. Not.												
10. Clerical									400		100	
11. Personal Service												
12. Entertainment												
13. Protection												
14. Educat. & Train.												
15. Health												
16. Welfare												
17. Admin. & Organ.												
18. Research & Des.			100	100								
Total	1,400	2,400	200	100	0	0	0	0	0	400	0	100

Figures do not add to totals because some categories were too small to include.

Type of Education Required for Additional Jobs 1971-1991

Metal Fabricating +13,700

Ontario

Job Family	Science				Arts				Commerce			
	E	S	CC	U	E	S	CC	U	E	S	CC	U
1. Tools-Spec.												
2. Tools-Non-Spec.	1,900	2,400	500	100								
3. Machines Spec.												
4. Mach.-Non-Spec.	1,000	1,800	300									
5. Inspection	100	600	100	100								
6. Vehicle Operat.												
7. Farm												
8. Sales Know.Req.												
9. Sales Know. Not.												
10. Clerical									1,400	100	100	
11. Personal Service												
12. Entertainment												
13. Protection												
14. Educat. & Train.												
15. Health												
16. Welfare												
17. Admin. & Organ.	300	200	200						200	100	100	
18. Research & Des.	100	200	200									
Total	3,000	5,200	1,300	600	0	0	0	0	1,600	200	200	

Figures do not add to totals because some categories were too small to include.

Machinery -6,600

Type of Education Required for Additional Jobs 1971-1991

Ontario

Job Family	Science				Arts				Commerce			
	E	S	CC	U	E	S	CC	U	E	S	CC	U
1. Tools-Spec.												
2. Tools-Non-Spec.	700	1,200	200									
3. Machines Spec.												
4. Mach.-Non-Spec.	400	800	100									
5. Inspection		400	100									
6. Vehicle Operat.												
7. Farm												
8. Sales Know.Req.												
9. Sales Know. Not.												
10. Clerical									1,100		100	
11. Personal Service												
12. Entertainment												
13. Protection												
14. Educat. & Train.												
15. Health												
16. Welfare												
17. Admin. & Organ.			100	300						100		
18. Research & Des.			100	200								
Total	1,100	2,400	600	500	0	0	0	0	1,100	100	100	

Figures do not add to totals because some categories were too small to include.

Type of Education Required for Additional Jobs 1971-1991

Transportation Equipment +36,700

Ontario

Job Family	Science				Arts				Commerce			
	E	S	CC	U	E	S	CC	U	E	S	CC	U
1. Tools-Spec.												
2. Tools-Non-Spec.	3,900	8,700	100	200								
3. Machines Spec.												
4. Mach.-Non-Spec.	2,600	5,800	100	100								
5. Inspection	300	2,800	100	400								
6. Vehicle Operat.												
7. Farm												
8. Sales Know.Req.												
9. Sales Know. Not.												
10. Clerical									5,100	200	400	
11. Personal Service												
12. Entertainment												
13. Protection												
14. Educat. & Train.												
15. Health												
16. Welfare												
17. Admin. & Organ.	200	100	400						200	100	400	
18. Research & Des.		300	1,000									
Total	6,800	17,500	700	2,100	0	0	0	0	5,300	300	800	

Figures do not add to totals because some categories were too small to include.

Type of Education Required for Additional Jobs 1971-1991

Electrical Products +108,000

Ontario

Job Family	Science				Arts				Commerce			
	E	S	CC	U	E	S	CC	U	E	S	CC	U
1. Tools-Spec.												
2. Tools-Non-Spec.	4,000	17,100	400	500								
3. Machines Spec.												
4. Mach.-Non-Spec.	6,000	22,800	700	800								
5. Inspection	1,400	8,600	2,100	1,400								
6. Vehicle Operat.												
7. Farm												
8. Sales Know.Req.												
9. Sales Know. Not.												
10. Clerical									17,100	100	200	
11. Personal Service												
12. Entertainment												
13. Protection												
14. Educat. & Train.												
15. Health												
16. Welfare												
17. Admin. & Organ.	1,500	800	1,000						1,200	700	1,000	
18. Research & Des.		1,900	5,800									
Total	11,400	50,000	5,900	9,500	0	0	0	0	18,300	800	1,200	

Figures do not add to totals because some categories were too small to include.

Type of Education Required for Additional Jobs 1971-1991

Non-metallic mineral products +20,600 — Ontario

Job Family	Science				Arts				Commerce			
	E	S	CC	U	E	S	CC	U	E	S	CC	U
1. Tools-Spec.												
2. Tools-Non-Spec.	1,500	3,300	200	100								
3. Machines Spec.												
4. Mach.-Non-Spec.	1,600	3,500	200	100								
5. Inspection					200	1,000	100	100				
6. Vehicle Operat.										1,700	100	100
7. Farm												
8. Sales Know.Req.												
9. Sales Know. Not.												
10. Clerical	1,000	900										
11. Personal Service												
12. Entertainment												
13. Protection												
14. Educat. & Train.												
15. Health												
16. Welfare												
17. Admin. & Organ.				500		500					500	
18. Research & Des.			100	200			100	100				
Total	4,100	7,700	500	900	200	1,500	200	200	0	1,700	600	100

Figures do not add to totals because some categories were too small to include.

Type of Education Required for Additional Jobs 1971-1991

Petroleum & Coal Products -2,500 Ontario

Job Family	Science				Arts				Commerce			
	E	S	CC	U	E	S	CC	U	E	S	CC	U
1. Tools-Spec.												
2. Tools-Non-Spec.	200	300										
3. Machines Spec.												
4. Mach.-Non-Spec.	200	200		100								
5. Inspection		200	100									
6. Vehicle Operat.												
7. Farm												
8. Sales Know.Req.												
9. Sales Know. Not.												
10. Clerical									300	100		
11. Personal Service												
12. Entertainment												
13. Protection												
14. Educat. & Train.												
15. Health												
16. Welfare												
17. Admin. & Organ.		100		100								
18. Research & Des.				300								
Total	400	800	100	500	0	0	0	0	0	300	100	0

Figures do not add to totals because some categories were too small to include.

Type of Education Required for Additional Jobs 1971-1991

Chemical & Chemical Products +4,600

Ontario

Job Family	Science				Arts				Commerce			
	E	S	CC	U	E	S	CC	U	E	S	CC	U
1. Tools-Spec.												
2. Tools-Non-Spec.	100	400		100								
3. Machines Spec.												
4. Mach.-Non-Spec.	200	700	100									
5. Inspection		200	100	100								
6. Vehicle Operat.												
7. Farm												
8. Sales Know.Req.												
9. Sales Know. Not.		400	100									
10. Clerical										700		100
11. Personal Service												
12. Entertainment												
13. Protection												
14. Educat. & Train.												
15. Health												
16. Welfare												
17. Admin. & Organ.			100	100							100	100
18. Research & Des.			100	200								
Total	300	1,700	500	500	0	0	0	0	0	700	100	200

Figures do not add to totals because some categories were too small to include.

Type of Education Required for Additional Jobs 1971-1991

Construction +49,100

Ontario

Job Family	Science				Arts				Commerce			
	E	S	CC	U	E	S	CC	U	E	S	CC	U
1. Tools-Spec.	2,000	3,200	200									
2. Tools-Non-Spec.	10,000	17,600	200									
3. Machines Spec.	800	1,400	100									
4. Mach.-Non-Spec.	800	900	100									
5. Inspection	800	800	100	100								
6. Vehicle Operat.	700	1,200										
7. Farm												
8. Sales Know.Req.												
9. Sales Know. Not.												
10. Clerical									1,700	100	300	
11. Personal Servic.												
12. Entertainment												
13. Protection												
14. Educat. & Train.												
15. Health												
16. Welfare												
17. Admin. & Organ.	2,500	1,500	1,500									
18. Research & Des.		100	400									
Total	15,100	27,600	2,300	2,000	0	0	0	0	1,700	100	300	

Figures do not add to totals because some categories were too small to include.

Type of Education Required for Additional Jobs 1971-1991

Transportation +12,500

Ontario

Job Family	Science				Arts				Commerce			
	E	S	CC	U	E	S	CC	U	E	S	CC	U
1. Tools-Spec.												
2. Tools-Non-Spec.	900	1,700										
3. Machines Spec.												
4. Mach.-Non-Spec.												
5. Inspection												
6. Vehicle Operat.	2,500	2,400		100								
7. Farm												
8. Sales Know.Req.												
9. Sales Know. Not.												
10. Clerical									1,600			200
11. Personal Service												
12. Entertainment												
13. Protection												
14. Educat. & Train.												
15. Health												
16. Welfare												
17. Admin. & Organ.						200					100	300
18. Research & Des.				100								
Total	3,400	4,100	0	200	0	200	0	0	1,600	100		500

Figures do not add to totals because some categories were too small to include.

Storage -900

Type of Education Required for Additional Jobs 1971-1991

Ontario

Job Family	Science				Arts				Commerce			
	E	S	CC	U	E	S	CC	U	E	S	CC	U
1. Tools-Spec.												
2. Tools-Non-Spec.	100	100	100									
3. Machines Spec.												
4. Mach.-Non-Spec.	100											
5. Inspection		100										
6. Vehicle Operat.		100										
7. Farm												
8. Sales Know.Req.												
9. Sales Know. Not.												
10. Clerical	100	100										
11. Personal Service												
12. Entertainment												
13. Protection												
14. Educat. & Train.												
15. Health												
16. Welfare												
17. Admin. & Organ.						100						
18. Research & Des.												
Total	300	400	100	0	0	100	0	0	0	0	0	0

Figures do not add to totals because some categories were too small to include.

Type of Education Required for Additional Jobs 1971-1991

Communications -11,000

Ontario

Job Family	Science				Arts				Commerce			
	E	S	CC	U	E	S	CC	U	E	S	CC	U
1. Tools-Spec.		200	600	600								
2. Tools-Non-Spec.												
3. Machines Spec.												
4. Mach.-Non-Spec.												
5. Inspection		200	200	100								
6. Vehicle Operat.												
7. Farm												
8. Sales Know.Req.												
9. Sales Know. Not.												
10. Clerical									5,500	700		700
11. Personal Service												
12. Entertainment												
13. Protection												
14. Educat. & Train.												
15. Health												
16. Welfare												
17. Admin. & Organ.			100	200				100		400	100	
18. Research & Des.				200								
Total	0	400	900	1,100	0	0	0	100	0	5,900	800	700

Figures do not add to totals because some categories were too small to include.

Type of Education Required for Additional Jobs 1971-1991

Electric Power, Gas & Water Utilities +11,300 — Ontario

Job Family	Science				Arts				Commerce			
	E	S	CC	U	E	S	CC	U	E	S	CC	U
1. Tools-Spec.		1,100	200	200								
2. Tools-Non-Spec.	1,000	1,600	200	100								
3. Machines Spec.												
4. Mach.-Non-Spec.												
5. Inspection		700	100	100								
6. Vehicle Operat.												
7. Farm												
8. Sales Know.Req.												
9. Sales Know. Not.												
10. Clerical										2,600	100	
11. Personal Service												
12. Entertainment												
13. Protection												
14. Educat. & Train.												
15. Health												
16. Welfare												
17. Admin. & Organ.		200		200							100	200
18. Research & Des.			200	600								
Total	1,000	3,600	700	1,200	0	0	0	0	0	2,600	200	200

Figures do not add to totals because some categories were too small to include.

Type of Education Required for Additional Jobs 1971-1991

Wholesale Trade +99,600

Ontario

Job Family	Science				Arts				Commerce			
	E	S	CC	U	E	S	CC	U	E	S	CC	U
1. Tools-Spec.												
2. Tools-Non-Spec.	4,000	9,500	300	300								
3. Machines Spec.												
4. Mach.-Non-Spec.	1,600	3,200	100	100								
5. Inspection												
6. Vehicle Operat.	3,500	5,300										
7. Farm												
8. Sales Know.Req.		5,000	800	400								
9. Sales Know. Not.												
10. Clerical									12,600	2,500	2,500	
11. Personal Service									20,500		2,200	
12. Entertainment												
13. Protection												
14. Educat. & Train.												
15. Health												
16. Welfare												
17. Admin. & Organ.					10,600	1,500	2,500			1,500	2,500	
18. Research & Des.			300	1,000								
Total	9,100	23,000	1,500	1,800	0	10,600	1,500	2,500	0	33,100	4,000	7,200

Figures do not add to totals because some categories were too small to include.

Type of Education Required for Additional Jobs 1971-1991

Retail Trade +177,200

Ontario

Job Family	Science				Arts				Commerce			
	E	S	CC	U	E	S	CC	U	E	S	CC	U
1. Tools-Spec.												
2. Tools-Non-Spec.	7,000	22,700	600	600								
3. Machines Spec.												
4. Mach.-Non-Spec.	1,500	4,300	100	100								
5. Inspection												
6. Vehicle Operat.	5,000	5,700										
7. Farm												
8. Sales Know.Req.										3,400	1,000	500
9. Sales Know. Not.										42,500	5,000	3,000
10. Clerical									1,000	22,000	1,500	1,500
11. Personal Service												
12. Entertainment												
13. Protection												
14. Educat. & Train.												
15. Health												
16. Welfare												
17. Admin. & Organ.					20,800		2,800				11,000	2,800
18. Research & Des.						100	100					
Total	13,500	32,700	700	700	0 20,800	100	2,900		1,000	67,900	18,500	7,800

Figures do not add to totals because some categories were too small to include.

Type of Education Required for Additional Jobs 1971-1991

Finance, Insurance & Real Estate +113,300 — Ontario

Job Family	Science				Arts				Commerce			
	E	S	CC	U	E	S	CC	U	E	S	CC	U
1. Tools-Spec.												
2. Tools-Non-Spec.						2,000	1,100	1,000				
3. Machines Spec.												
4. Mach.-Non-Spec.												
5. Inspection												
6. Vehicle Operat.												
7. Farm												
8. Sales Know.Req.										10,000	8,000	4,000
9. Sales Know. Not.												
10. Clerical										45,000	12,800	6,400
11. Personal Service						1,000	500	500				
12. Entertainment												
13. Protection												
14. Educat. & Train.												
15. Health												
16. Welfare												
17. Admin. & Organ.						3,000	3,000	3,000		3,000	3,000	3,000
18. Research & Des.						100	200	300			100	200
Total	0	0	0	0	0	6,100	4,800	4,800	0	58,000	23,900	13,600

Figures do not add to totals because some categories were too small to include.

Type of Education Required for Additional Jobs 1971-1991

Community, Business & Personal Services +991,000 — Ontario

Job Family	Science				Arts				Commerce			
	E	S	CC	U	E	S	CC	U	E	S	CC	U
1. Tools-Spec.					4,760	4,760			4,760	16,750	2,000	665
2. Tools-Non-Spec.									9,520	47,025	4,760	1,140
3. Machines Spec.		1,905	950	950								
4. Mach.-Non-Spec.	2,380	7,520	475	190								
5. Inspection					570	2,475	1,430	1,430				
6. Vehicle Operat.					4,760	4,855						
7. Farm												
8. Sales Know.Req.						2,855	570	570				
9. Sales Know. Not.									760	3,905	1,620	1,620
10. Clerical										110,430	5,710	5,710
11. Personal Servic.					71,400	142,795	47,600	27,600				
12. Entertainment					950	10,590	3,500	4,760				
13. Protection					2,570	5,235	190	380				
14. Educat. & Train.						8,570	23,800	95,195				
15. Health (refer to following page)												
16. Welfare										4,285	8,570	12,850
17. Admin. & Organ.		9,520	6,650		3,810	20,945	3,235	11,425		9,520	9,520	6,665
18. Research & Des.		1,905	6,095				1,905	5,995				
Total	2,380	9,425	12,850	13,885	88,820	203,080	82,230	147,355	15,040	191,915	32,180	28,650

Figures do not add to totals because some categories were too small to include.

Type of Education Required for Additional Jobs 1971-1991
Ontario

Community, Business & Personal Services +991,000

	Health			
Job Family	E	S	CC	U
Health	4,760		104,715	52,360
Total	4,760	0	104,715	52,360

Figures do not add to totals because some categories were too small to include.

Type of Education Required for Additional Jobs 1971-1991

Public Administration and Defence +187,600 — Ontario

Job Family	Science				Arts				Commerce			
	E	S	CC	U	E	S	CC	U	E	S	CC	U
1. Tools-Spec.												
2. Tools-Non-Spec.					7,000	18,000	1,400	600				
3. Machines Spec.												
4. Mach.-Non-Spec.					1,000	2,300	400	200				
5. Inspection						6,000	2,000	2,000				
6. Vehicle Operat.					2,900	2,900						
7. Farm												
8. Sales Know.Req.												
9. Sales Know. Not.												
10. Clerical									52,300	6,000	6,000	
11. Personal Service					1,800	4,000	600	700				
12. Entertainment												
13. Protection			3,000	3,000		18,800						
14. Educat. & Train.												
15. Health												
16. Welfare												
17. Admin. & Organ.			1,000	2,000		2,000	2,000	10,000			1,000	3,000
18. Research & Des.			1,000	3,000		1,000	1,000	3,000				1,300
Total	0	0	5,000	8,000	12,700	55,000	7,400	16,500	0	52,300	7,000	10,300

Figures do not add to totals because some categories were too small to include.

HD
5729
.06
.M24

Manpower requirements.